أستخدم نموذج الطلب شبه الأمثل لتحليل الطلب الخارجى للفرولة المصرية

عمرعلى محمد على، سهام عبد العزيز حسن مروان،محمد سيد شحاتة ،عبداللة محمودعبدالمقصود

قسم الاقتصاد الزراعي ، كلية الزراعة جامعة عين شمس

بيانات البحث	المستخلص
	أصبحت الصادرات خيارا استراتيجياً للنمو والتنمية في جميع دول العالم، **حيث تمثلت مشكلة** الدراسة في تذبذب صادرات الفراولة المصرية بمعدلات عالية نحو الأسواق الخارجية، لذلك **تهدف الدراسة** إلى تقدير **نموذج الطلب الشبه الأمثل** لصادرات الفراولة المصرية، حيث **توصلت** النتائج إلى أن (بلجيكا -المملكة المتحدة -ألمانيا)هم أهم الأسواق المستوردة من حيث القيمة حيث بلغ متوسط القيمة نحو 15.755 و 12.965 و 11.063 ألف دولار على التوالي. كما أظهرت النتائج أن المرونة السعرية للطلب في الأسواق قيد الدراسة بلغت نحو -10.55٪، -6.60٪، -5.15٪. أي انها سلعة ذات طلب مرن ، كما اوضحت مرونة الطلب التقاطعية وجود علاقة احلالية بين الفراولة المصرية والفراولة الإسبانية وعلاقة تكاملية بين الفراولة المصرية والهولندية في السوق البلجيكي ، وفي سوق المملكة المتحدة هناك علاقة احلالية بين الفراولة المصرية والفراولة الإسبانية وعلاقة تكاملية بين الفراولة المصرية والمغربية، وفي السوق الألماني هناك علاقة إحلالية بين الفراولة المصرية والهولندية وعلاقة تكاملية بين الفراولة المصرية والفراولة الإسبانية، وتشير نتائج مرونة الإنفاق إلى أن صادرات الفراولة المصرية تمثل سلعة عادية ضرورية في الأسواق الثلاثة، وأوصت الدراسة بضرورة دراسة أسعار صادرات الدول المنافسة، وكذلك ضرورة المحافظة على عدم رفع الأسعار في الأسواق قيد الدراسة.

الباحث المسئول: عمرعلى محمد على

البريد الإلكتروني: OmarAli@Agr.asu.edu.eg
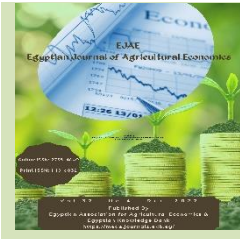
Using the Almost Ideal Demand Model to Analyze the External Demand for Egyptian Strawberries

Omar Ali Mohamed Ali   **Seham Abdel Aziz Hassan Marwan**

Mohamed Sayed Shehata   **Abdallah Mahmoud Abdelmaqsoud**

Department of Agricultural Economics, Faculty of Agriculture, Ain Shams University

A R T I C L E   I N F O

A B S T R A C T

Exports have become a strategic choice for growth and development in all countries of the world, **The study's problem** was the fluctuation of Egyptian strawberry exports at high rates toward foreign markets, so **The study aims** to estimate the **Almost Ideal Demand Model** functions for Egyptian strawberry exports, where **the results** showed that (Belgium, the Kingdom, and Germany) are the most important importing markets in terms of value, as their average value was about15.755, 12.965, 11.063 thousand dollars respectively. The results also showed that the price elasticity of demand in the markets under study amounted to about -10.55%, -6.60%, -5.15%. That is, it is a commodity with elastic demand, as the results of the cross-elasticity of demand indicate that there is a substantial relationship between the Egyptian strawberries and the Spanish strawberries and a complementary relationship between the Egyptian strawberries and the Dutch in the Belgian market , and in the UK market there is a local relationship between the Egyptian strawberry and the Spanish strawberries And a complementary relationship between the Egyptian and Moroccan strawberries, and in the German market there is a replacement relationship between the Egyptian and Dutch strawberries and an integrated relationship between the Egyptian strawberries and the Spanish strawberries, and the results of the spending elasticities indicate that the Egyptian strawberry exports are necessary normal commodity in the three markets, and the study recommended the need to study the export prices of competing countries, as well as The need to maintain not to raise prices in the markets under study.

Corresponding Author: **Omar Ali Mohamed Ali**

Email OmarAli@Agr.asu.edu.eg

Introduction

Export has become a strategic choice for growth and development in all countries of the world, as the growth of exports is reflected at a positive rate on the domestic product, and thus the improvement of the permanent deficit in the trade balance and raising the standard of living of citizens in the country.

Strawberries are considered one of the most promising crops, which Egypt has tended to produce at large rates, and it is one of the crops with a large yield and is exported either fresh, frozen, or processed, and Egypt has a competitive advantage in its production and exports early strawberries to European countries, where the export season begins in November to February, and for Arab countries, it starts from December to May.

The average value of Egyptian strawberry exports reached about 88 million pounds during the period (2017-2021) 3.3% of the value of total exports worldwide and 7.8% of the value of exports of Egyptian vegetable crops.

The research Problem:

The problem of the study was the fluctuation of the Egyptian strawberry at high rates towards foreign markets, as well as problems related to intensive competition, and the conditions for entering these markets considering international agreements and decisions, which require facing the replacement of Egyptian strawberry exports with the exports of competing countries within some markets, which may negatively affect the Egyptian national economy.

Objective of the study

The main objective of the research is to estimate the demand functions for Egyptian strawberry exports in the most important global markets using the **Almost Ideal Demand Model** to estimate the elasticity of demand price in Egypt and the most important competition as well as the cross and spending elasticity, to determine the price advantage and the possibility of increasing competitiveness in those markets, to formulate proposed policies for Egyptian exports to enhance agricultural competitiveness for sustainable and inclusive agricultural development.

Research method and data sources

We use the import and export data set, which was compiled by the Trade Map Website, to analyze quantitative and price indices of trading conditions. The main factors affecting agricultural exports in Egyptian with the rest of the world will be estimates and multiple linear regression functions. (Quantity purchased, price of goods and selected other commodities, price index, direct and cross elasticities …etc).

Accordingly, suggested policies will be formulated to develop Egyptian vegetable exports to the most important countries with a positive impact on agricultural competitiveness for a sustainable agricultural development strategy. Knowledge of the demand structure is essential for sectoral and macroeconomic policy analysis. In the medium and the long run, the structure of final external demand help to improve the structure of foreign trade operations with the rest of the world.

Derivation of Demand Growth Almost Ideal Demand System (AIDS):

For empirical work ((De Jenvey, A. 1995) time series data are usually needed to observe price changes and estimate price elasticities. The linear Expenditure System (LES) developed by Stone (1954), the Almost Ideal Demand System (AIDS) developed by Deaton and Muellbauer (1980), and the combination of these two systems into a Generalized Almost Ideal Demand System (GAIDS) proposed by Bollino (1990) are widely used for analyzing the demand system.

Our research is based on the Almost Ideal Demand System Model and the study relied on time series data (2007-2021) collected from website data. www.trademap.org, www.fao.org **.**

Results and discussion

First: Indicators of foreign trade of Egyptian strawberries:

1- The evolution of the quantity of Egyptian exports of strawberries:

Table (1) shows a study of the evolution of the quantity of Egyptian exports of strawberries per thousand tons during the period (2007-2021), from which it was found that the quantity of exports reached the lowest in 2020 about 17.5 thousand tons, while its maximum in 2016 was estimated at 138.6 thousand tons, while the average period as a whole was about 53 thousand tons. It was found that the average quantity of exports during the period (2007 - 2011) reached about 52.7 thousand tons, then increased to reach about 64.6 thousand tons during the period (20 12-201 6) with an increase of about 22.5% from the average period (2007-2011), then decreased to reach 41.6 thousand tons during the period (2017-2021) with a decrease It was about 35.5% of the average period (2012-2016), while he average period (2017-2021) was about 21% lower than the average period (2007-2011).

The same table shows the evolution of the percentage of exports from the production of the strawberry crop during the period (2007-2021), and from that, it was found that the average percentage of exports was likely between increase and decrease, as it reached the lowest in 2020 by about 2.9%, while it reached its maximum in 2016, where it was estimated at 36.5%, while the general average for the period as a whole was about 13.8%, and it was found that the average percentage of exports from production in the period (2007-2011) was about 21.1%, and then decreased to about 17.1% during the period (2012-2016), then decreased to 7.4% during the period (2017-2021).

The reason for the decrease is attributed to the cessation of some countries from importing due to the COVID-19, which occurred in early 2020.

And by studying the degree of stability of the quantity of Egyptian exports of strawberries by estimating the coefficients of the degree of stability during the period (2007-2021), where the same table indicates that the value of coefficients ranged between a minimum of about 3.3% in 2014, and a maximum of about 161% in 2016 The average general index of the degree of economic stability of the quantity of Egyptian exports of strawberries is about 0.0%, and these results indicate that the amount of Egyptian exports during the study period reaches

342

relative stability, as the closer the value of the index to the general average towards zero, this indicates stability relative stability.

By studying the evolution of the quantity of Egyptian exports of strawberries, equation No. (1) Table No. (2) the statistical analysis attempts indicate that the significant increase in the quantity of strawberry exports in any mathematical form during the study period was not proven, which reflects that the data revolves around its average (relative stability).

2- The evolution of the value of Egyptian exports of strawberries:

Table (1) shows a study of the evolution of the value of Egyptian exports of strawberries at-million dollars during the period (2007-2021), from which it was found that the value of exports reached the lowest in 2001, about 12 million dollars, while the maximum-in 2021 was estimated at 110 million dollars, while the average period as a whole was about 74.1 million dollars. It was found that the average value of exports during the period (2007-2011) amounted to about 55 million dollars, then increased to reach 79 million dollars during the period (2012-2016), an increase of about 44% over the average period (2007-2011), then increased to reach 88.2 million dollars during the period (2017-2021), an increase of About 11.4% of the average period (2012-20 21), while the average period (2017-20 21) increased by about 60.4% of the average period (2007-2011).

By studying the degree of stability of the value of the Egyptian exports of strawberries during the period (2007-2021), where Table (1) indicates that the value of stability coefficients ranged between a minimum of about 1.3% in 2013, and a maximum of about 75.1 % in 2007, and the average general index of the degree of economic stability of The value of Egyptian exports of onions is about 0.4%, and these results indicate that the value of Egyptian exports during the study period reaches relative stability, as the closer the value of the general index of the degree of stability towards zero, this indicates stability and relative stability.

By studying the evolution of the value of Egyptian exports of strawberries, equation (2) Table (2) indicates that the value of exports took a general trend increasing by an annual statistically significant amount at a significant level of 1% amounting to about 3.6 million / dollars, representing about 4.9% of the average value of exports during that period, and the value of the coefficient of determination indicates that 52 % of the changes in the value of exports are due to variables whose impact reflects the time factor, and the significance of the model used for the nature of the data has been proven.

The increase in the value of strawberry exports is due to the increase in export prices, as the export price of strawberries rises, especially in January, due to the Christmas holidays in the importing countries of Egyptian strawberries.

3- The evolution of the price of Egyptian exports of strawberries:

Table (1) shows a study of the evolution of the price of Egyptian exports of strawberries USD / ton during the period (2007-2021), from which it was found that the price of exports reached the lowest in 2007 by about 557 dollars/ton, while its maximum in 2021 was estimated

343

at about 4876 dollars/ton, while the average period was about 1924 dollars /ton. It was found that the average export price during the period (2007-2011) was about 1199 dollars/ton, then increased to reach 1712 dollars/ton during the period (2012-2016) with an increase of about 42.8% over the average period (2007-2011), then increased to reach 2863 dollars/tons during the period (2017-2021) with an increase of about 67.2% over the average period (2012-2016), while the average period (2017-2021) increased by about 183.8% over the average period (2007-2021).

And by studying the degree of stability of the price of Egyptian exports of strawberries during the period (2007-2021), where the same table indicates that the value of stability coefficients ranged between a minimum of about 8.2% in 2016, and a maximum of about 110.4% in 2012, and the average general index of the degree of economic stability of the price of Egyptian exports from strawberries about 1.06%, and these results indicate that the price of Egyptian exports during the study period is unstable, as the closer the value of the general index of the degree of stability towards zero, this indicates stability and relative stability.

By studying the evolution of the price of Egyptian exports of strawberries, equation No. (3) Table No. (2) indicates that the price of exports has taken a general trend of increasing by an annual statistically significant at a significant level of 5% amounting to about 163.3 dollars per ton, representing about 8.4% of the average price of exports during that period, and the value of the coefficient of determination indicates that 28% of the changes in the price of Exports are due to variables whose effect reflects the time factor, and the significance of the model used for the nature of the data has been proven.

4- The evolution of the quantity of production of Egyptian strawberries:

Table No. (1) shows a study of the evolution of the quantity of Egyptian strawberry production in P/ton during the period (2007-2021), from which it was found that the quantity of production reached its lowest in 2007 at about 174 thousand / ton, while its maximum reached in 2021 where it was estimated at about 597 thousand / ton, while the average period A total of about 496 thousand / ton.

It was found that the average quantity of production during the period (2007-2011) was about 219 thousand / tons, then increased to reach 321 thousand / tons during the period (2012-2016), an increase of about 46.5% over the average period (2007-2011), and then increased to reach 571 thousand /ton during the period (2017-2021), an increase of about 77.8% over the average period (2012-2016), while the average period (2017-2021) increased by about 160.7% over the average period (2007-20 21).

By studying the development of the quantity of Egyptian strawberry production in thousands/ton, equation No. (4) Table No. (2) indicates that the amount of production has taken a general trend increasing by an annual statistically significant quantity at a significant level of 5% amounting to about 29.2 thousand tons, representing about 8.8% of the average quantity of production during that period, and the value of the coefficient of determination indicates

that85% of the changes in the quantity of production are due to variables whose impact reflects the time factor, and the significance of the model used for the nature of the data has been proven.

The reasons for the increase in strawberry production may be due to the increase in export prices, as the export price increases by about 163 dollars /ton annually.

Table (1): Evolution of the Quantity, Value and Average Export Price of Egyptian Strawberries and Instability Coefficients during the Period (2007-2021):

Years	Export Quantity (Thousand tons)	Value of exports Million Dollar	Export Price USD/Ton	Output quantity (Thousand tons)	Quantity of exports to the quantity of production %	** Stability Coefficient		
						Export Quantity	value Exports	Export Price
2007	21.61	12.04	557	174	12.39	-59.45	-75.10	-28.67
2008	75.62	52.23	691	200	37.76	41.99	0.39	-26.82
2009	66.99	86.51	1291	243	27.59	25.89	55.27	16.56
2010	24.51	65.49	2672	238	10.28	-53.90	10.25	110.23
2011	74.98	58.72	783	240	31.20	41.12	-6.92	-45.41
Average	52.74	55.00	1199	219	21.1*	-0.87	-3.22	5.18
2012	22.95	77.20	3363	242	9.47	-56.76	15.62	110.49
2013	33.21	69.48	2092	262	12.66	-37.39	-1.39	18.79
2014	54.75	75.48	1379	283	19.31	3.30	1.81	-28.34
2015	73.50	73.81	1004	435	16.88	38.79	-5.16	-51.91
2016	138.60	100.01	721	379	36.57	161.91	22.70	-67.97
Average	64.60	79.20	1712	321	17.1+	21.97	6.72	-3.79
2017	40.61	90.00	2216	319	12.73	-23.19	5.64	-8.22
2018	43.59	74.21	1703	445	9.79	-17.51	-16.51	-33.94
2019	83.97	88.36	1052	545	15.40	59.06	-4.54	-61.62
2020	17.58	78.54	4467	597	2.94	-66.67	-18.40	53.78
2021	22.57	110.03	4876	571	3.95	-57.19	10.10	58.93
Average	41.66	88.23	2863	496	7.41*	-21.10	-4.74	1.78
Overall average	53.00	74.14	1924	329	13.8*+	0.00	-0.42	1.06

*Refers to the geometric mean.

**Stability coefficient = $|\hat{Y} - Y| / \hat{Y}$

Source: Collected and calculated from the data available in the following

1-www.trademap.org

2- www. faostastat.org

Table (2): Results of Statistical Estimation of General Time Trends for Quantity, Value ,and Prices of Exports of Egyptian Strawberry Crop during the Period (2007-2021):

M	Variable	Estimated model	R^2	F	The annual rate of change	Nature of change Yearly
1	Export Quantity thousands/tons	$\hat{Y} = 53.34 - 0.04X_i$ (2.85)* (0.21)	0.10	0.04	-	Stable
2	Valueof exports Million/ USD	$\hat{Y} = 44.66 + 3.68X_i$ (5.03)** (3.77)**	0.52	14.26	4.96	Increase
3	Export Price USD/Ton	$\hat{Y} = 617.46 + 163.3X_i$ (0.94) (2.26)*	0.28	5.12	8.48	Increase
4	Production quantity Thousand /Tons	$\hat{Y} = 111.1 + 29.22X_i$ (3.69)** (3.30)**	0.85	78.01	8.88	increase

Y_i: The dependent variable, expresses (the quantity of exports - the value of exports - the price of exports - the quantity of production).

X i: time variable, $_I = (1, 2, ..., 15)$.

 * Significant at the level of 5%.

** Significant at 1%.

Source: Collected and calculated from the data of Table (1) of the study.

5- Geographical distribution of Egyptian strawberry exports:

Table (3) shows the geographical distribution of Egyptian strawberry exports during the period (2017-2021), where it turns out that Saudi Arabia is one of the most important importing countries for Egyptian strawberries during the study period, as it absorbs approximately 10.902 thousand tons and represents about 26.1% of the total quantity of Egyptian exports, which is estimated at 41.663 thousand tons, and Belgium and Iraq, Germany, Syria, the United Kingdom and the UAE are in the second to fifth places where their import capabilities are about 3.822, 3.381 , 3.618, 3.348, 3.191, 2.386) thousand tons and represent about (9.1%, 8.6%, 8.1%,8%7.6%, 5.7%) of the total quantity of Egyptian exports of the strawberries respectively, Kuwait, Russia, the Netherlands, France and Oman came in sixth to tenth place, with an average of about 1.755,1.608,1.305, 1.284, 647) thousand tons , representing about (4.2%, 3.8%, 3.1%, 3% ,1.5%) of the average total quantity of Egyptian strawberry exports respectively.

As Belgium and the United Kingdom come in first and second places as the most important importing countries of Egyptian strawberries in terms of value, where their value reached about 15755, 12964 thousand dollars, representing about 17.8%, 14.6% of the total value of Egyptian exports of strawberries' estimated at about 88226 thousand dollars, then comes all from Germany, Saudi Arabia, Russia, UAE, the Netherlands, Kuwait in the third to eighth places respectively with a value of exports amounting to about (11063, 8692, 6950, 3417, 5839, 2780)thousand dollars, by (12.5%, 9.8%, 7.8%, 6.6 % 3.8%, 3.1%) of the total value of Egypt's exports of strawberries during that period, respectively.

Table (3): Geographical Distribution and Relative Importance of Egyptian Strawberry Exports by Quantity, Value and Price Worldwide during the Period (2017-2021):

Countries	Average export quantity 1000/Ton	%	Value of exports averages 1000/dollar	%	Average export price USD/ton	P_{index}
Saudi Arabia	10902	26.17	8692	9.85	2473	86.36
Belgium	3822	9.17	15755	17.86	4199	146.66
Iraq	3618	8.68	2191	2.48	2379	83.10
Germany	3381	8.12	11063	12.54	3648	127.41
Syria	3348	8.04	2357	2.67	3349	116.98
United Kingdom	3191	7.66	12965	14.69	3641	127.17
United Arab Emirates	2386	5.73	5840	6.62	2994	104.58
Kuwait	1755	4.21	2780	3.15	2735	95.52
Russia	1608	3.86	6950	7.88	4373	152.75
Netherlands	1305	3.13	3417	3.87	3176	110.94
France	1284	3.08	1648	1.87	3055	106.70
Oman	647	1.55	1189	1.35	2792	97.52
Libya	623	1.50	696	0.79	2244	78.39
South Africa	455	1.09	1678	1.90	3967	138.57
Qatar	454	1.09	231	0.26	2035	71.08
Other countries	2883	6.92	9613	10.90	3484	121.69
The total world	41663	100.00	88226	100.00	2863	100.00

Source: Collected and calculated from data available at www.trademap.org.

It is also clear from the data of the same table that the average export prices of Egyptian strawberries in the world during the period (2017-2021), where the average world price was estimated at about 2863 dollars/ton during that period, and the export price of Egyptian strawberries to Russia recorded the highest export price in the world, estimated at about 4373 dollars/ton, representing about 152.7 % of the average price of world exports, followed by the export prices of Belgium, South Africa, and Germany, which were estimated at (4198, 3967, 3647)dollars/ton, which constituted about (146.6%,138.5 ,127.4%)of the average price of Egyptian exports during the same period for each of them, respectively.

Qatar and Libya recorded the lowest export price of Egyptian strawberries in the world, reaching about (2035, 2244) dollars/ton, which constituted about (71%, 78.3%) of the average price of Egyptian exports of strawberries during the same period.

Second: The results of estimating (AIDS) in the markets under study:

Where the most important importing markets for Egyptian strawberries were selected based on the geographical distribution, which was studied during the period (2017-2021), which was represented in the Belgian market, the United Kingdom, and Germany, where the value of Egypt's exports to Belgium amounted to about 15755 thousand dollars, representing

347

about 17.8% of the total value of Egypt's exports of strawberries, and the value of exports of each of The United Kingdom and Germany are about (12965,11063) thousand dollars, representing about (14.6%,12.5%) respectively.

It is clear from the table data of the results of (AIDS) for Egyptian strawberries in all the study markets that it was confirmed that there are no estimation problems that can affect the efficiency of the model, whether autocorrelation, heterogeneity, and natural non-distribution, and it was also confirmed that the test (Wald test in EViews) was not significant and the conditions of addition, homogeneity and symmetry, and the validity of the model was also verified.

A- Results of estimating (AIDS) for Egyptian strawberries in the Belgian market:

Table (4) shows that an increase in the price of Egyptian strawberries by 1% leads to an increase in the Egyptian market share by 6.60% and that an increase in the price of Dutch strawberries by 1% leads to an increase in the Egyptian market share by 20.96%, and the table also shows that the increase in total spending on strawberries in the Belgian market by 1% leads to a decrease in the Egyptian market share of strawberries by 11%, and the adjusted coefficient of determination is about 0.88, meaning that the variables The function explains about 88% of the changes in the demand for Egyptian strawberries in the Belgian market, while the rest of the changes are due to other factors that were not taken into account.

Table (4): Results of Estimation of (AIDS) for Egyptian Strawberries in the Belgian Market during the Period (2007-2021).

Country	Egypt			Netherlands			Spain		
	Coeff.	t-stat.	Prob.	Coeff.	t-stat.	Prob.	Coeff.	t-stat.	Prob.
A	192.4	2.78	0.01	-968.32	-6.99	0.00	-41.78	-0.51	0.61
LnP_1	6.60	3.79	0.00	7.69	2.21	0.05	-9.31	-4.59	0.00
LnP_2	20.96	2.11	0.05	51.75	2.56	0.02	-31.29	-2.65	0.02
LnP_3	5.56	1.14	0.27	33.09	3.40	0.00	15.08	2.66	0.02
$Ln(E/P_{spi})$	-11.01	-9.11	0.00	40.35	2.96	0.01	39.47	4.97	0.00
Adj. RSq.	0.88			0.81			0.78		
F	27.23	0.00		15.81	0.00		13.13	0.00	
Auto	0.01	0.91		0.15	0.69		0.29	0.58	
Hetro	2.68	0.06		0.64	0.95		4.21	0.37	
Non-Norm	1.51	0.46		0.81	0.66		0.02	0.98	

Y: The relative weight of the values of the exports of Egypt, Netherlands and Spain in the BelgianMarket.
P: Export prices to Egypt, Netherlands, and Spain in the Belgian market
Source: Collected and calculated from data available at www.trademap.org.

It is also shown from the same table that the increase in the price of strawberries in the Netherlands by 1% leads to an increase in the Dutch market share by 51.75%, while the increase in the price of strawberries for both Egypt and Spain by 1% leads to an increase in the Dutch market share by 7.6%, 33% respectively, and it is also clear that the increase in the total spending of strawberries in the Belgian market by 1% leads to an increase in the Dutch market share by 40.3%. The adjusted coefficient of determination was about 0.81, meaning

that the function variables explain about 81% of the changes in the demand for Dutch strawberries in the Belgian market, while the rest of the changes are due to other factors that were not considered.

It is also shown from the same table that the increase in the price of Spanish strawberries by 1% leads to an increase in the market share of Spain by 15%, while the increase in the price of strawberries for Egypt and the Netherlands by 1% leads to a decrease in the Spanish market share by 9.31%, 31.29 % respectively, It is also clear that the increase in total strawberry spending in the Belgian market by 1% leads to an increase in the Dutch market share by 39.47%. The adjusted coefficient of determination was about 0.78. That is, the variables of the function explain about 78% of the changes in the demand for Spanish strawberries in the Belgian market, while the rest of the changes are due to other factors that were not considered.

From the previous presentation, it is clear the strength of the Egyptian strawberry competition in the Belgian market for the Spanish strawberry.

- **The results of estimating the price, cross, and spending elasticities of the external demand for Egyptian strawberries in the Belgian market:**

Table (5) shows the price elasticity, cross, and spending of Egyptian strawberries in the Belgian market, where it shows that the increase in the price of Egyptian strawberries by 1% leads to a decrease in demand by 10.55%, and this means that it has a flexible demand in this market, and therefore it is necessary to maintain not to raise the export prices of Egyptian strawberries in the Belgian market.

While the cross elasticity indicates that the increase in the prices of strawberries exported from competing countries (Netherlands - Spain) by 1% leads to a change in demand by about 14.5% and 7.21% respectively, while the increase in the prices of strawberries exported from Egypt by 1% leads to a change in demand by -34.2%,65.2% respectively.

This illustrates the non-competitive complementary relationship in the case of high prices in the Netherlands, where the signal of cross elasticity was negative with the Netherlands, while the relationship is competitive with Spain whenever the prices of Spanish strawberries rise.

Regarding the elasticity of spending demand, it was found that the increase in total real spending on strawberries in the Belgian market by 1% leads to an increase in spending on Egyptian strawberries by 0.07%, while it was about 3.94%, 6.43% for the Netherlands and Spain, and this indicates that it is a normal commodity necessary for Egypt and normal. Luxury for competing countries (the Netherlands and Spain).

Table (5): Price, cross elasticity, and spending elasticities of the demand for strawberries in the Belgian market during the period (2007-2021).

spending elasticities	Price and cross elasticity			Country
	Spain	Netherlands	Egypt	
0.07	7.21	14.53	-10.55	Egypt
3.94	-18.92	-37.58	-34.23	Netherlands
6.43	-38.39	78.95	65.24	Spain

Source: Collected and calculated from the data of Table (4) of the study.

B- Results of estimating (AIDS) for Egyptian strawberries in the UK market:

Table (6) shows that the increase in the price of Egyptian strawberries by 1% leads to a decrease in the Egyptian market share by 11% and that the increase in the price of strawberries for Spain and Morocco by 1% leads to an increase in the Egyptian market share by 43.92%, 23.73%, respectively, and it is also shown from the table that the increase in total spending on strawberries in the UK market by 1% leads to a decrease in the Egyptian market share of strawberries by 8.7 %, and the adjusted coefficient of determination was about 0.83 That is, the variables of the function explain about 83% of the changes in the demand for Egyptian strawberries in the UK market, while the rest of the changes are due to other factors that were not taken into account.

It is also shown from the same table that the increase in the price of Spanish strawberries by 1% leads to a decrease in the Dutch market share by 77%, while the increase in the price of strawberries for Egypt and Morocco by 1% leads to a decrease in the Spanish market share by 26.37% and 22.2 % respectively, and it is also clear that the increase in total strawberry spending in the UK market By 1%, which leads to an increase in the Spanish market share by 9.44%. The adjusted coefficient of determination was about 0.60 That is, the variables of the function explain about 60% of the changes in the demand for Spanish strawberries in the UK market, while the rest of the changes are due to other factors that were not considered.

Table (6): Results of Estimation of (AIDS) Application Model for Egyptian Strawberry in the UK Market during the Period (2007-2021).

Country	Egypt			Spain			Morocco		
	Coeff.	t-stat.	Prob.	Coeff.	t-stat.	Prob.	Coeff.	t-stat.	Prob.
A	-368.14	-2.83	0.02	103.00	3.12	0.01	-402.73	-2.85	0.02
LnP_1	-11.07	-2. 21	0.05	-26.37	-2. 10	0.05	8.21	1.47	0.17
LnP_2	43.92	3.36	0.01	-77.05	-2.31	0.04	36.79	2.59	0.03
LnP_3	23.73	5.67	0.00	-22.26	-2. 11	0.05	9.90	2.18	0.05
$Ln(E/P_{spi})$	-8.74	-6.71	0.00	9.44	2.84	0.02	4.65	3.29	0.01
Adj. RSq.		0.83			0.60			0.61	
F	17.95		0.00	6.35		0.01	6.38		0.01
Auto	7.51		0.06	0.84		0.48	0.48		0.49
Hetro	1.70		0.79	1.89		0.76	1.69		0.79
Non-Norm	0.87		0.65	0.19		0.91	0.35		0.84

Y: The relative weight of the values of the exports of Egypt, Spain and Morocco in the UK Market.
P: Export prices to Egypt, Spain and Morocco in the UK market
Source: Collected and calculated from data available at www.trademap.org.

It is also shown from the same table that the increase in the price of strawberries to Morocco by 1% leads to an increase in the market share of Morocco by 9.9%, while the increase in the price of Spanish strawberries by 1% leads to an increase in the Spanish market share by 36.7%, and it is also clear that the increase in total strawberry spending in the UK market by 1% leads to Morocco's market share decreased by 4.6%. The adjusted coefficient of determination was about 0.61 That is, the variables of the function explain about 61% of the changes in the demand for Moroccan strawberries in the UK market, while the rest of the changes are due to other factors that were not considered.

From the previous presentation, the Egyptian strawberry competition in the UK market is strong for Spanish strawberries.

- The results of estimating the price, cross, and spending elasticities of the external demand for Egyptian strawberries in the UK market:

Table (7) shows the price, cross, and spending elasticities of Egyptian strawberries in the UK market, where it shows that the increase in the price of Egyptian strawberries by 1% leads to a decrease in demand by 6.60%, which means that it has a flexible demand in this market, and therefore it is necessary to maintain not to raise the export prices of Egyptian strawberries in the UK market.

While the cross indicated that the increase in the prices of strawberries exported from competing countries (Spain - Morocco) by 1% leads to a change in demand for them by about 76.5% and 78.6% respectively, while the increase in the prices of strawberries exported from Egypt by 1% leads to a change in demand by 1.43%, -10.91% respectively.

This illustrates the non-competitive complementary relationship in the case of high prices in Morocco, where the signal of the cross was negative with a, while the relationship with Spain is competitive whenever the prices of Spanish strawberries rise in the UK market.

Regarding the elasticity of spending demand, it was found that increasing the total real spending on strawberries in the UK market by 1% leads to an increase in spending on Egyptian strawberries by 0.10%, while it represented about 1.11%, and 2.37% respectively for Spain and Morocco, indicating that it is a normal commodity necessary for Egypt and an ordinary luxury for Morocco and Spain.

Table (7): Price, cross, and spending elasticities of the demand for strawberries in the UK market during the period (2007-2021).

spending elasticities	Price and cross elasticity			Country
	Morocco	Spain	Egypt	
0.10	76.53	78.61	-6.60	Egypt
1.11	-0.65	-11.37	1.43	Spain
2.37	-2.73	-102.13	-10.91	Morocco

Source: Collected and calculated from the data of Table (6) of the study.

C- Results of estimating (AIDS) for Egyptian strawberries in the German market:

Table (8) shows that the increase in the price of Egyptian strawberries by 1% leads to a decrease in the Egyptian market share by 0.74% and that the increase in the price of strawberries for Spain and the Netherlands by 1% leads to an increase in the Egyptian market share by 0.48%, 1.40%, respectively, and it is also shown from the table that the increase in total spending on strawberries in the German market by 1% leads to a decrease in the Egyptian market share of strawberries by 3.99 %, and the adjusted coefficient of determination was about 0.96 That is, the variables of the function explain about 96% of the changes in the demand for Egyptian strawberries in the German market, while the rest of the changes are due to other factors that were not considered.

It is also shown from the same table that the increase in the price of Spanish strawberries by 1% leads to a decrease in the market share by 6.03%, while the increase in the price of strawberries in Egypt by 1% leads to an increase in the Spanish market share by 10.06%, while the price of Dutch strawberries by 1% leads to a decrease in the market share of Spain by 11.02%, respectively, and it is also clear that the increase in the total spending of strawberries in The German market by 1% leads to an increase in the Spanish market share by 13.84%. The adjusted coefficient of determination was about 0.57 That is, the variables of the function explain about 57% of the changes in the demand for Spanish strawberries in the German market, while the rest of the changes are due to other factors that were not considered.

Table (8): Results of estimating (AIDS) for Egyptian strawberries in the German market during the period (2007-2021).

Country	Egypt			Spain			Netherlands		
	Coeff.	t-stat.	Prob.	Coeff.	t-stat.	Prob.	Coeff.	t-stat.	Prob.
A	31.21	11.13	0.00	8.31	0.24	0.82	57.28	2.67	0.02
LnP_1	-0.74	-2.80	0.02	10.06	3.04	0.01	-6.16	-3.05	0.01
LnP_2	0.48	2.31	0.04	-6.03	-2.33	0.04	3.23	2.18	0.05
LnP_3	1.40	3.62	0.00	-11.02	-2.28	0.05	10.02	3.39	0.01
$Ln(E/P_{spi})$	-3.99	-13.21	0.00	13.84	3.66	0.00	-11.12	-4.82	0.00
Adj. RSq.	0.96			0.57			0.75		
F	79.58		0.00	5.95		0.01	11.42		0.00
Auto	3.51		0.06	3.28		0.07	0.54		0.46
Hetro	0.42		0.98	0.94		0.92	0.52		0.97
Non-Norm	0.50		0.78	0.28		0.87	0.58		0.75

Y: The relative weight of the values of the exports of Egypt, Spain and Netherlands in the German Market.
P: Export prices to Egypt, Spain and Netherlands in the German market.
Source: Collected and calculated from data available at www.trademap.org.

It is also shown from the same table that the increase in the price of strawberries to the Netherlands by 1% leads to a decrease in the share of the Dutch market by 10.02%, while the increase in the price of Egyptian strawberries by 1% leads to a decrease in the Dutch market

share by 6.16%. While the increase in the price of Spanish strawberries by 1% leads to an increase in the market share of the Netherlands by 3.23%, it is also clear that the increase in total strawberry spending in the German market by 1% leads to a decrease in the market share of Morocco by 11.12%. The adjusted coefficient of determination was about 0.75. That is, the variables of the function explain about 75% of the changes in the demand for Dutch strawberries, while the rest of the changes are due to other factors that were not considered.

From the previous presentation, it is clear the strength of the Egyptian strawberry competition in the German market for the Dutch strawberry.

- The results of estimating the price, cross, and spending elasticities of the external demand for Egyptian strawberries in the German market:

Table (9) shows the price elasticity, cross, and spending of Egyptian strawberries in the German market, where it is clear that the increase in the price of Egyptian strawberries by 1% leads to a decrease in demand by 5.15%, and this means that it has a flexible demand in this market, and therefore it is necessary to maintain not to raise the export prices of Egyptian strawberries in the German market.

While the cross indicates that the increase in the prices of strawberries exported from competing countries (Spain - the Netherlands) by 1% leads to a change in demand for them by about 69.63% and 12.45%, respectively, while the increase in the prices of strawberries exported from Egypt by 1% leads to a change in demand by -0.67% and 3.22%, respectively.

This illustrates the non-competitive complementary relationship in the case of high prices in Spain, where the signal of the cross was negative with Ha, while the relationship is competitive with the Netherlands whenever the prices of Dutch strawberries rise in the German market.

Regarding the elasticity of spending demand, it was found that an increase in total real spending on strawberries in the German market by 1% leads to an increase in spending on Egyptian strawberries by 0.15%, while it represented about 1.17%, and 0.22% respectively for Spain and the Netherlands, indicating that it is a normal commodity necessary for Egypt and the Netherlands and an ordinary luxury for Spain.

Table (9): Price, cross, and spending elasticities of the demand for strawberries in the   German market during the period (2007-2021).

spending elasticities	Price and cross elasticity			Country
	Netherlands	**Spain**	**Egypt**	
0.15	**12.45**	**69.63**	**-5. 15**	**Egypt**
1.17	**-2.55**	**-14.91**	**-0.67**	**Spain**
0.22	**-11.42**	**63.87**	**3.22**	**Netherlands**

Source: Collected and calculated from the data of Table (8) of the study.

353

Recommendations
- The need to maintain not to raise prices in the markets under study where they face flexible demand in those markets.
- The need to maintain the competitive advantage of the Egyptian strawberry in the markets under study for him, considering the date and price of export and quality.
- The need for integration between the state and the private sector to encourage strawberry producers to increase production and thus increase crop exports.
- The need to open new markets for competition by paying attention to the quality specifications and tastes of consumers required in foreign markets and making the necessary publicity to promote the Egyptian strawberry.

References:

Arabic References:
- Central Agency for Public Mobilization and Statistics.
- Hisham Ali Hassan El-Gendy, Hedy Ali Hassan (Doctors.), The <u>Competitive Status of Egyptian Orange Exports in the Most Important Foreign Markets</u>, Journal of Agricultural Economic and Social Sciences, Mansoura University, 2014.
- Walid Mohamed Lefty Abu Auf Nassar, <u>Structural Changes in the Wheat Milling Industry in Egypt</u>, PhD Thesis, Department of Agricultural Economics, Faculty of Agriculture, Ain Shams University, 2011.
- Ehab Mourid Shaaban, (Doctor) Economic <u>Analysis of the External Demand for Egyptian Potatoes Using the Almost Ideal Demand Model (AIDS)</u>, Egyptian Journal of Agricultural Economics, Volume Twenty-Seven, Issue Two, June (B) 2017.
- Iman Farid Amin Adoos, Ibrahim Ali Mohamed Abdel Fattah (Doctors), <u>Estimation of the Almost Ideal Demand Model (AIDS) for Egyptian Orange Exports</u> in the most important foreign markets, Journal of Agricultural Economics and Social Sciences, Volume Eleven, 2020.
- Fatima MohMD, Mahmoud Al-Rifai (Doctors) <u>Estimation of the Almost Ideal Demand Model (AIDS) for Egyptian Potato Crop Exports to the Most Important Foreign Markets, Volume Thirty-Two</u>, Issue III, September 2022

English References:
- Deaton, A. and Muellbauer, J. 1980. "An Almost Ideal Demand System." American Economy Review 70: 312-326.
- Gujarati, Damodar, Basic Econometrics, McGraw- Hell, International Book Company, London, 1983.
- Blanc Forti, L., Green, R. and King, G. 1986. U.S. Consumer Behavior over the postwar Period: An Almost Ideal Demand System Analysis. Giannini Foundation Monograph n°. 40. Davis: University of California, Department of Agricultural Economics.
- Deaton, A. 1989. "Household Survey Data and Pricing Policies in Developing Countries." World Bank Economic Review 3:183-210.
- Deaton, A. 1990. "Price Elasticities from Survey Data: Extensions and Indonesian Results." Journal of Econometrics 44:281-309.
- Green, R. and Julian, M. 1990 "Elasticities in AIDS Models." American Journal of Agricultural Economics 72:442-445.
- www.trademap.org,
- www.faostat.org